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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,383	08/17/2000	John Wilkes	10004565	5243

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Hewlett-Packard Company
Intellectual Property Administration
P O Box 272400
Fort Collins, CO 80527-2400

EXAMINER

INOA, MIDYS

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 08/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/641,383

Applicant(s)

WILKES ET AL.

Examiner

Midys Inoa

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to because in figure 3, reference symbol 76 fails to clarify what is meant by "success".

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The disclosure does not provide a description of the shared status replacement policy of claims 6 and 7 or;

a discussion of eviction failure in claims 5 and 13.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 5-7 and 13-15 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Art Unit: 2186

Regarding Claim 5 and 13, it is not clear where the specification supports or explains the concept of the eviction operation failing.

Regarding Claims 6, 7, 14 and 15, the specification does not mention the use of shared or unshared status as the basis for a replacement policy during the eviction process.

Applicant is required to point out specific pages and lines, and figures, which support the invention set forth in the specified Claims.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3, draws a distinction between writing dirty and demoting clean data however, it is unclear as to the difference between a demote operation and a write operation.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C.

Art Unit: 2186

122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1-5, 8-13 and 18-~~19~~ are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Takagi (5,933,853).

Regarding Claim 1, Takagi discloses a system including a cache memory 4 ("host cache") and a HDD cache 5 ("storage cache") where data is being transferred between the cache memory and the HDD cache (See Abstract). In Column 4, Lines 10-14, Takagi teaches the reading of program data from the HDD 3 ("storage system") to the CPU 1 ("Computer System") and refers to the cache memory 4 ("host cache") as a high-level data storage device (Column 4, Lines 30-32). Takagi also teaches the situation in which data is being staged out or demoted from the cache memory 4 to the HDD cache 5 (Column 5, Lines 22-25).

Regarding Claim 8, Takagi discloses a system with a cache memory 4 ("host cache"), a HDD cache 5 ("storage system cache"), a CPU 1 ("host system"), and an array of optical discs 22a-22d ("storage media") in which data is being demoted or staged out from cache memory 4 to HDD cache 5 (See Figure 1). In the demotion process, the data is transferred and stored in the HDD cache 5 and therefore, removed from cache memory 4; thus, exclusion is maintained ("Means for exclusive caching", see Column 5, Lines 22-25).

Regarding Claims 2 and 9, Takagi teaches the demotion of data from the cache memory 4 to the HDD cache 5 where the process of demoting or staging out includes the operation of writing back or evicting data to the HDD cache 5 (Column 5, Line 25). Takagi discloses that the demotion process between the cache memory 4 and the HDD cache 5 is being done through the communication path labeled as a "system bus" in Figure 1.

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Regarding Claim 3, Takagi teaches that dirty or high frequency data ("clean data") are written to the HDD cache 5 (Column 5, Lines 22-25). It is noted that the demotion operation and the write operation seem to be similar and that no distinction has been made between the two.

Regarding Claim 4 and 12, Takagi teaches that in the process of staging out, data is being stored in the HDD cache 5 (Column 5, Lines 22-25).

Regarding Claims 5 and 13, Takagi teaches the eviction of data from HDD cache 5 to the optical disk 24 ("storage media") in Column 5, Lines 30-31 ("Performing an eviction from storage system cache"). Takagi also teaches that in cases where "writing is not effected", the data is disposed of ("Discarding the information if the eviction fails", see Column 5, Line 26).

Regarding Claims 10 and 11, Takagi teaches a system in which the communication control is connected to a LAN or network link ("Network Communication link") and the components are connected through a computer bus (Column 4, Lines 43-48).

Regarding Claim 18, Takagi discloses the use of an array of optical disks as the storage media of his system (Column 1, Lines 12-13).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2186

10. Claims 6-7 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (5,933,853) in view of Nakamoto (6,253,290).

Takagi teaches the invention as set forth for claims 1 and 8 under 35 U.S.C. 102(b) above. Takagi does not teach the use of a shared status as the basis for eviction. Nakamoto discloses a method that uses the shared status of data to monitor write operations. In this method, unshared data is written back and shared data is written through (Column 2, Lines 48-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the shared status taught by Nakamoto as the means for eviction in Takagi in order to ensure that unshared data is properly secured in main memory while making space for shared, more frequently accessed data in the cache.

11. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (5,933,853) in view of McIntosh-Smith (6,324,632).

Takagi teaches the invention as set forth for claims 1 and 8 under 35 U.S.C. 102(b) above. Takagi does not teach a partition in the storage cache where one partition is for read-ahead data ("other cached information") and the other is for exclusive caching. McIntosh-Smith discloses a partitioned cache where one of the partitions is allocated to a pre-fetched incoming data stream and the other is being used to store program data (such as that involved in exclusive caching). Please refer to the abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Takagi system to include the partitioned cache in the McIntosh-Smith patent in order to ensure that pre-fetching operations and the exclusive caching system do not interfere.

Art Unit: 2186

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (5,933,853) in view of How Computers Work by Ron White.

Takagi teaches the use of a magnetic storage medium and a plurality of removable storage media (Column 2, Line 7). However, Takagi does not specifically disclose the use of tape as storage media. White teaches that tape drives are the most traditional and one of the most convenient ways of backing up and storing data (Page 105). White also discloses that tape drives have become affordable. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Takagi's magnetic storage medium to be a tape drive since these are affordable and convenient storage devices.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Easton et al. (4,603,380), DASD Cache Block Staging.
- Menon et al. (5,283,884), CKD Channel with Predictive Track Table
- Shibata (5,353,428), Information Processing Apparatus in which a Cache Memory can be operated in both Store-in and Store-through modes
- Mattson et al. (5,542,066), Destaging Modified Data Blocks from Cache Memory
- Marcon, Jr. et al. (5,600,817), Asynchronous Read-Ahead Disk Caching using Multiple Disks I/O Processes and Dynamically Variable Pre-fetch Length
- McNutt et al. (5,606,688), Method and Apparatus for Dynamic Cache Memory Allocation via Single-Reference Residency Times

Art Unit: 2186

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Midys Inoa whose telephone number is (703) 305-7850. The examiner can normally be reached on M-F 7:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on (703) 305-3821. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6606 for regular communications and (703) 308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Midys Inoa

Midys Inoa
Examiner
Art Unit 2186

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July 30, 2002

Reginald G. Bragdon
REGINALD G. BRAGDON
PRIMARY EXAMINER